

Fitness For Our Force

Cardiovascular Disease Risk Factors and other Special Populations

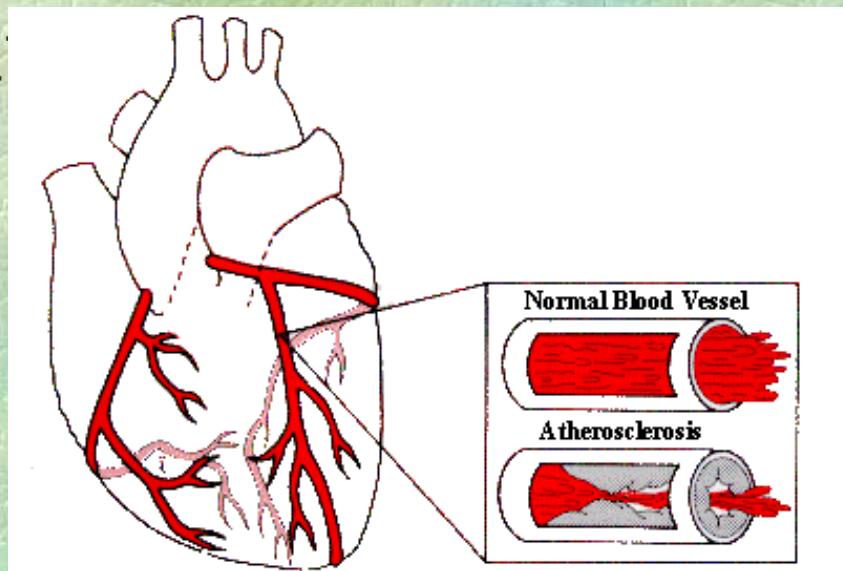
Lesson 7

**Cardiovascular risk -
the likelihood of a patient
developing any
cardiovascular condition.**

**Risk factors include:
elevated lipids, high blood
pressure, diabetes, smoking,
increasing age, male
gender, stress, lack of
exercise.**

Coronary Artery Disease (CAD)

- Heart The leading cause of death in the United States
- It accounts for nearly one third of all deaths

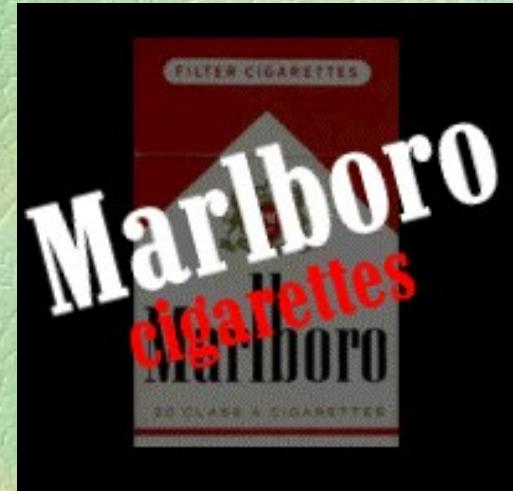


Definition

- CAD results from the accumulation of fatty deposits within the coronary arteries
- The lifestyle a person chooses plays a big part in determining whether or not you develop CAD.

Cigarette Smoking

- The more you smoke the greater the risk of getting CAD.
- To reduce the risk of CAD, it is recommended to stop smoking.



Elevated Serum Cholesterol Level

- ☞ Cholesterol is a fatty substance manufactured by the body and is also found in some of the food we eat.
- It is transported in the blood stream and if there is excessive amounts of it, it will adhere to the arterial wall.
- A reduction of the dietary intake of cholesterol usually results in a decrease in the serum cholesterol concentration.
- Serum cholesterol levels are directly related to the incidence of CAD.

Elevated Triglycerides

- Triglycerides are free fatty acids
- Reducing the intake of sugar and alcohol and reducing body fat can lower triglycerides



Hypertension (high blood pressure)

- ✿ People with chronic high blood pressure are three to four times more likely to develop CAD.
- To help reduce this condition weight reduction, cessation of smoking, decreased psychological stress, reduced salt intake and increased exercise should have beneficial effects.



Obesity

- Obesity is related to CAD only in that people who are obese are more likely to have other risk factors of CAD.
- Consistant exercise and decreased caloric intake will have the greatest effect in reducing obesity.

Physical Inactivity

- Active individuals have a reduced risk of hypertension, high cholesterol, and high triglyceride levels.



Diabetes

- This is a condition in which blood sugar levels are not properly controlled.
- This condition can be controlled and managed.



Stress

- Recent studies have shown that suppressed anger and aggressiveness are causes of CAD.
- Exercise can be helpful in reducing stress.



Family History, Age, Gender

- ↳ These three risk factors cannot be altered.
 - Those with a family history of cardiopulmonary, metabolic disease, or CAD are at a greater risk of developing CAD.
 - As age increases so do the chances of having CAD.
 - Men are more likely to get CAD than women.

Physical Activity and Health

- ❖ The Benefits of Physical Activity Are Well Established
- Regular Exercise Protects Against the Development and Progression of Many Chronic Diseases and Is an Important Component of a Healthy Lifestyle.
- Some Exercise Is Better Than None, and More Exercise Is Better Than Less.

Moderate Activity

□ F.I.T.T. Factors for

Cardio-Respiratory Fitness

- Frequency: 3-5 Days a Week
- * Intensity: 60%-90% Mhr
- * Time: 20-60+ Min.
- * Type: Aerobic

Reduces the Risk of Dying From Heart Disease

- 🕒 Reduces Resting Systolic and Diastolic Blood Pressure
- 🕒 Increases Serum High Density Lipoprotein (HDL) Cholesterol
- 🕒 Decreases Serum Triglycerides

Helps Build and Maintain Healthy Bones, Muscles, and Joints

- Artheritis
- reduces amount of muscular atrophy associate with aging
- Functional fitness

Helps Control Weight

- Body Fatness reduced
- Lean body mass preserved
 - (muscle burns more calories even at rest)

Reduces the Risk of Developing Diabetes

- Reduced Insulin Needs and Better Glucose Tolerance

Reduces the Risk of
Developing High Blood
~~Pressure~~ Helps Reduce Blood Pressure in
People Who Already Have High
Blood Pressure

Reduces the Risk of some types of Cancer

- Colon cancer

Reduces Feelings of Depression and Anxiety

- Promotes Psychological Well-Being
- reduces feelings of anxiety
- reduces feelings of anxiety

**Total cholesterol -
the total of all
components of
cholesterol (HDL, LDL,
VLDL, Lp(a). Common
dietary sources of
cholesterol include
meat, shellfish, dairy
foods.**

**HDL cholesterol -
the good
component of
cholesterol. Higher
levels of HDL are
associated with
decreased risk of
heart disease**

Cholesterol:HDL ratio

-

the number obtained by dividing the total cholesterol by the HDL. This correlates well with the risk of heart disease.

Myocardial Infarction

- ❖ Results When Blood Flow to the Heart Muscle Is Interrupted by a Total Blockage of a Coronary Artery
 - “Heart Attack”
 - A Common Form of Heart Attack, in Which the Blockage of a Coronary Artery Causes the Death of Part of the Heart Muscle

Physical Signs and Symptoms of a Myocardial Infarction

shortness of breath

- chest pains - sometimes confused with indigestion
- dizziness
- perspiration - sweating

EXERCISE: RISK FACTORS, PRECAUTIONS



AND BENEFITS

HIGH BLOOD PRESSURE (HYPERTENSION)

- Blood Pressure is the pressure that the blood exerts against the inner wall of the arteries



MEASUREMENTS OF BLOOD PRESSURE

- Normal blood pressure--120/80 mm Hg in adults
 - The larger number represents the systolic blood pressure--pressure in the artery at the time the heart beats.
 - The smaller number represents the diastolic blood pressure--pressure during the resting phase of the heart.
 - High blood pressure (hypertension) is considered blood pressure that is continually above 140/90.

RISK FACTORS OF HYPERTENSION

- 3-4 times more likely to develop CAD
- 7 times more likely to have a stroke

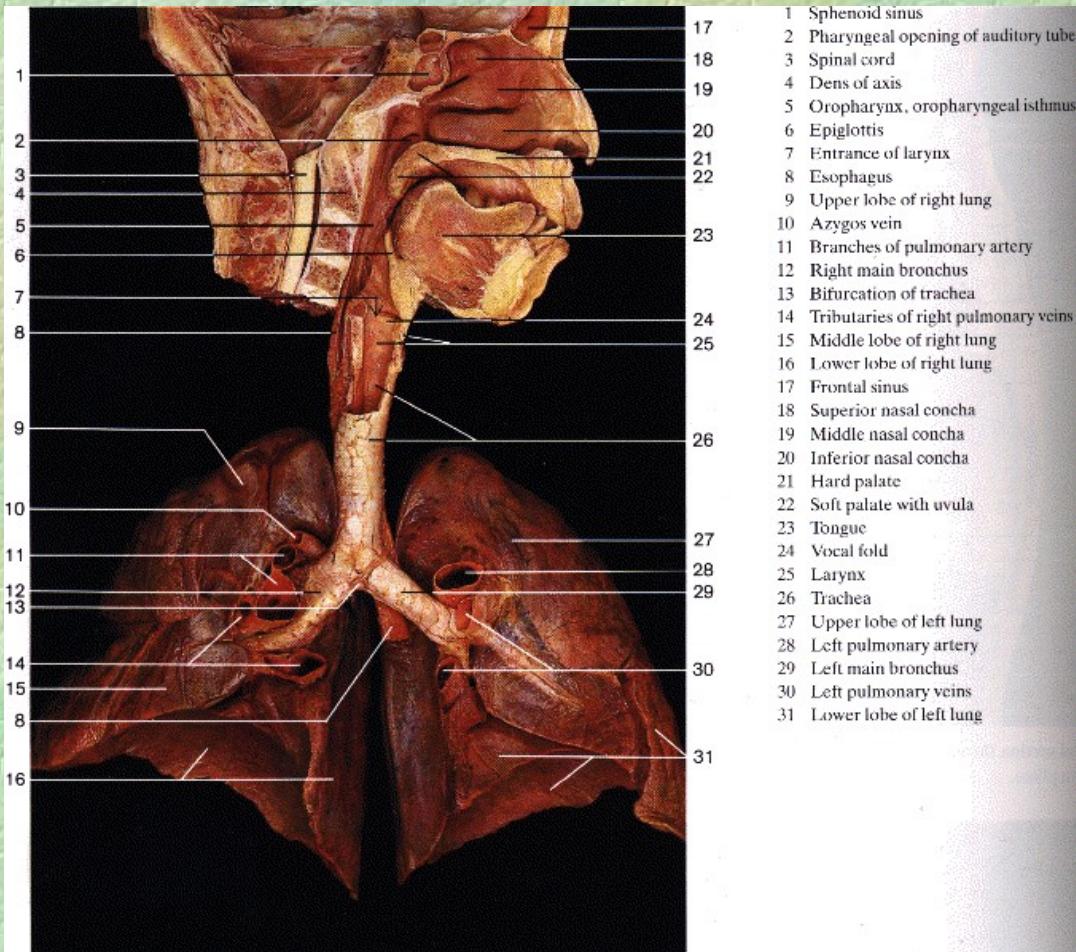
EXERCISE PRECAUTIONS

- Medical screening for exercise participation to predict hypertension is not necessary. Persons with known hypertension should follow usual risk stratification guidelines for exercise testing.

Hypertension -

- People With High Blood Pressure – Regular Physical Activity Helps Lower Blood Pressure.

RESPIRATORY SYSTEM



Respiratory system. The lungs have been fixed in expiration.

ASTHMA

- Asthma is a respiratory condition characterized by episodes of airflow obstruction in the bronchial tubes
 - Mild asthma: symptoms with exercise or cough; wheezing 1-2xs/week; responds to bronchodilators
 - Moderate asthma: presence of cough/wheeze more than 2xs/week; airway obstruction
 - Severe asthma-daily symptoms; frequent sleep disturbance; significant obstruction; frequent trips to ER

RISK FACTORS OF ASTHMA

- Asthma can be life threatening if airways become completely blocked leading to respiratory failure

EXERCISE PRECAUTIONS

- Use fast acting bronchodilators 15 minutes to one hour prior to exercise
- Peak flow monitoring for the first two weeks then as needed
- Exercise with pursed lip breathing

DIABETES



- ❖ A condition in which blood sugar levels are not properly controlled by the hormone insulin
- Type I Diabetes--which usually occurs in young people, the pancreas produces little or no insulin
- Type II Diabetes--which has an onset in adulthood, the pancreas produces insulin, but the body is unable to use it

RISK FACTORS OF DIABETES

- Accelerate atherosclerosis
- Damages some of the blood vessels not only in the heart but also in the brain
- Predisposes an individual to have a stroke
- Potentially leads to insulin shock, diabetic coma, diabetic blindness, and amputation of limbs

EXERCISE PRECAUTIONS

- Monitor blood glucose levels more frequently than usual when beginning an exercise program
- Decrease insulin dosage 1 to 2 units and/or increase carbohydrate intake prior to and during exercise
- Exercise with a partner and avoid exercise during periods of peak insulin level activity
- Inject insulin into the nonexercising areas, such as the abdomen
- avoid exercise in extreme heat or cold
- use proper footwear

People With Diabetes -

- Regular Physical Activity Can Help People With Chronic, Disabling Conditions Improve Their Stamina and Muscular Strength.

ARTHRITIS

- A term that refers to many rheumatic diseases including osteoarthritis, rheumatoid arthritis, systemic lupus erythematosus, gout, juvenile rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis.

❖ RISK FACTORS OF ARTHRITIS

- Pain, stiffness, and swelling in joints and other connective tissues
- Be cautious of unusual or persistent fatigue, increased weakness, decreased range of motion, increased joint swelling, or continuing pain during activities

EXERCISE PRECAUTIONS

✿ Three types of exercise are best:

- Range-of-motion exercises help maintain normal joint movement, relieve stiffness, and increase flexibility--should be done daily
- Strengthening exercises help to increase muscle strength to help support and protect joints--should be done daily
- Aerobic exercises improve cardiovascular fitness, help control weight, and improve overall function--should be done 20 to 30 minutes three times a week

People With Arthritis -

- ❖ Regular Physical Activity Can Help Control Joint Swelling and Pain. Physical Activity of the Type and Amount Recommended for Health Have Not Been Shown to Cause Arthritis.
 - preserves Range of Motion
 - Reduces or retards atrophy

HYPOGLYCEMIA



- Low blood sugar, occurs when blood levels of glucose drop too low to fuel the body's activity
- Blood sugar levels below 45 mg/dl are almost always associated with a serious abnormality
- Signs of hypoglycemia: feeling weak, drowsy confused, hungry, and dizzy; paleness; headache; irritability; trembling; sweating; rapid heart beat

RISK FACTORS OF HYPOGLYCEMIA

- A person can lose consciousness and even lapse into a coma

EXERCISE PRECAUTIONS

- Monitor blood glucose levels more frequently
- Increase carbohydrate intake prior to and during exercise
- Exercise with a partner

❖ *To Avoid Soreness and Injury, Individuals Contemplating an Increase in Physical Activity Should Start Out Slowly and Gradually Build up to the Desired Amount to Allow the Body to Adjust*

the benefits of exercise
usually outweigh the risks

Older Adults -

- ❖ No One Is Too Old to Enjoy the Benefits of Regular Physical Activity. Muscle Strengthening Exercises Can Reduce the Risk of Falling and Fracturing Bones and Can Improve the Ability of the Elderly to Live Independently.
- Functional fitness is improved.

Parents -

- Parents Can Help Their Children Maintain a Physically Active Lifestyle by Providing Encouragement and Opportunities for Physical Activity.
- Learned behavior.

Teenagers -

- Regular Physical Activity Improves Strength, Builds Lean Muscle Mass, Builds Bone Mass, and Decreases Body Fat.
- Growth and development
- Learned Behavior

Dieters -

- Regular Physical Activity Burns Calories and Preserves Lean Muscle Mass.

Older Adults -

- ❖ **No One Is Too Old to Enjoy the Benefits of Regular Physical Activity.**
- Muscle Strengthening Exercises Can Reduce the Risk of Falling and Fracturing Bones and Can Improve the Ability of the Elderly to Live Independently

Demographics of Aging

- ↳ By the Year 2030, the Number of Individuals 65 Yr and Over Will Reach 70 Million
- ↳ Persons 85 Yr and Older Are the Fastest Growing Segment of the Population



Aging and Exercise



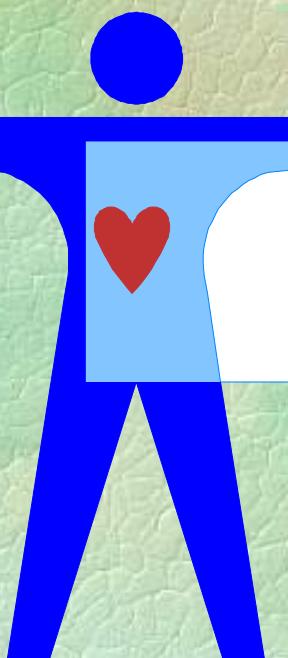
Participation in Regular Physical Exercise (Both Aerobic and Strength) Elicits a Number of Favorable Responses That Contribute to Healthy Aging.

Strength Training and Aging

- ❖ Helps to Offset the Loss in Muscle Mass and Strength Typically Associated With Aging
- Additional Benefits Include
 - Improved Bone Health
 - Reduction in Osteoporosis
 - Improved Postural Stability
 - Increased Range of Motion
 - Increased Flexibility

Cardiovascular(CV) Function

- ❖ Cardiovascular Responses to Exercise in Older Healthy Adults
 - Maximal CV Function Decreases 5-15% Per Decade After the Age of 25
 - Maximal Heart Rate Decreases 6-10 Beats Per Minute Per Decade



*The CV Responses of Older
Adults to Sub-Maximal
Exercise Are Qualitatively
and, in Most Cases,
Quantitatively Similar to
Those of Young Adults.*

Endurance Exercise Training and the CV System in Healthy Older Adults

- Older Adults Elicit the Same 10-30% Increases in Vo₂ From Endurance Training As Do Young Adults
- The Magnitude of the Increase in Vo₂ in Older Adults Is a Function of Training Intensity --*Just Like in Younger Adults*
- Arterial Stiffness Is Also Reported to Be Lower in More Fit Older Individuals

Effect of Endurance Exercise Training on CV Disease Risk Factors in Older Healthy Men and Women

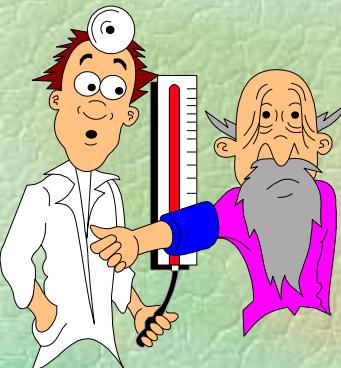
- Because CV Disease Is the Major Cause of Death in Older Men and Women, the Effect of Endurance Exercise Training on CV Disease Risk Factors Is of Paramount Importance.





Effects of Endurance Exercise Training on Older Healthy Men and Women

Glucose Tolerance and Insulin Sensitivity Increase

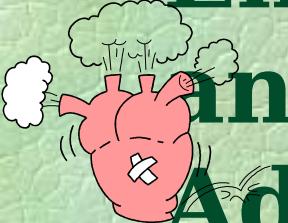


Blood Pressure Is Lowered to the Same Degree in Young and Old Hypertensive Adults

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- Older Adults Improve Their Cholesterol Profiles With Exercise Training
 - Body Composition Is Improved in a Similar Fashion in Older and Young Adults

Impact of Age-Associated Diseases on CV Responses to Exercise

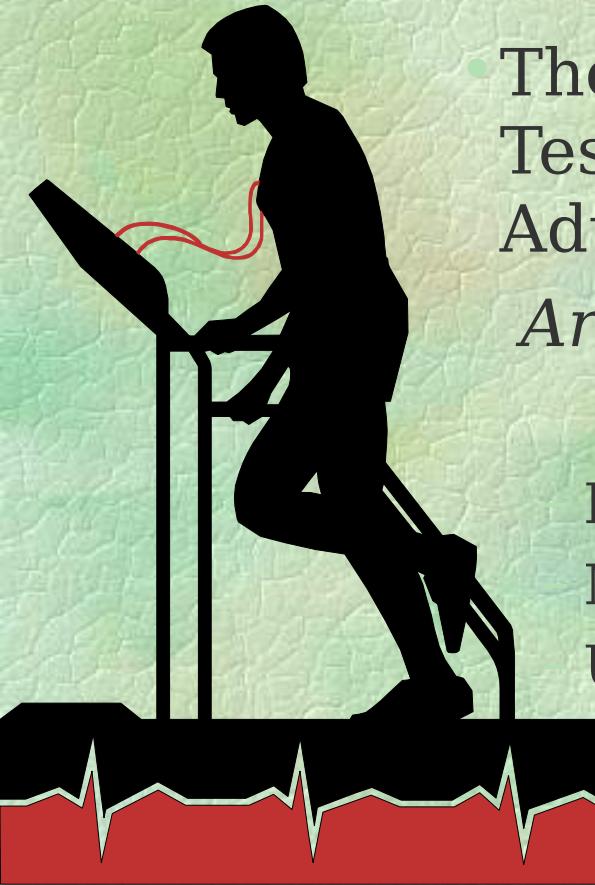
- ↳ Most CV Illnesses Are Much More Prevalent in Older Adults
- Older Adults With CV Disease Generally Have Higher Heart Rate and Blood Pressure in Response to Exercise Than Do Their Same Age Peers



Endurance Exercise Training and the CV System in Older Adults With CV Pathologies

- Older Adults With CV Disease Appear to Obtain the Same Beneficial CV Adaptations to Exercise Training As Do Young Adults Such As:
 - Decreased Heart Rate
 - Reduction in Body Weight & Body Fat
 - Improved Cholesterol Profile

Contraindications to Exercise Testing and Training



- The Contraindications to Exercise Testing and Exercise Training for Older Adults

Are the Same As for Young Adults:

Recent ECG Changes
Myocardial Infarct./Heart Attack
Unstable Angina/Chest Pain
Irregular Heart Beat

Recommendations

- ❖ Walking, Jogging/Running, Swimming, and Cycling
- The Initiation of a Regular Physical Activity Program Elicits Numerous Changes in the CV System That Benefit Older Adults

Strength Training in Healthy Older Adults

- Loss of Muscle Mass (Sarcopenia) With Age in Humans Is Well Documented
- After the Age of 30 There Is a Decrease in Muscle Size, Density and an Increase of Intra-Muscular Fat.
- A Reduction in Muscular Strength Is a Major Component of Aging
- Type II or 'Fast Twitch' Muscle Fiber Are Most Effected With Aging

Strength and Functional Capacity

- The Decline in Strength Has Significant Consequences Related to Functional Capacity



Protein Needs and Aging

- ↳ Inadequate Dietary Protein May Be an Important Cause of Sarcopenia (the loss of muscle mass)
- A Large Percentage of Older Adults Have Been Shown to Be Lacking an Adequate Intake of Protein Daily

Energy Metabolism

- ✿ Daily Energy Expenditure Declines Progressively Throughout Adult Life,
- The Increase in Body Fatness, a Decrease in Metabolic Rate, and a Decrease in Level of Activity Leaves Many Older Adults Obese Thus, Reducing the Likelihood of Exercise or Increased Physical Activity

